AVIATION

The Oldest American Aeronautical Magazine

OCTOBER 26, 1925 Issued Weekly PRICE 10 CENTS

The Curtiss Army Racer, which won the Pulitzer Trophy, and Lt. Bettis, the pilot.

VOLUME XIX

NUMBER 17

SPECIAL FEATURES

THE STATUS OF THE ROYAL AIR FORCE

AFTERMATHS OF THE AIR RACES

ADVANCE SCHNEIDER CUP NEWS

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Our Foreign Guests

THE interchange of opinions and suggestions between American designers, constructors and pilots and the foreign visitors who have come to see the New York and Baltimore races will have excellent results.

France was represented by the Breguet Brothers and Captains Lemaitre and d'Oisy with their interesting and successful day bombers. French aeronautical progress, particularly as to quantity production, is being watched in this country, perhaps with as much interest as any other development. While our manufacturers are thinking in terms of orders of tens and twenty-fives and the British look on orders of hundreds as large, the French are thinking in terms of thousands.

The British aeronautical industry has been looking at American aircraft through the eyes of Messrs. C. R. Fairey, A. V. Roe and H. T. Vane, the latter being the Managing Director of D. Napier and Son. Capt. C. B. Wilson representing the Royal Aero Club and Colonel Derby, Chairman of the Aircraft Disposal Co., are gathering information from a more personal standpoint. The premier pilots of England are represented by Captains Broad and Biard with Bert Hinkler as a reserve flier. Such trained observers will take back to England very definite impressions of our aerial status.

Italy with Sig. Macchi and Giovanni De Briganti and Morselli Riccardo, two of the best known Italian pilots, will not only demonstrate their country's latest seaplanes, but will show the flying technique that has always made Italy a formidable contender in the Schneider Cup race.

Not only will their representative aircraft people take back many helpful ideas, but, through their contact with the American aviation industry, will contribute much to our store of aeronautical knowledge. This phase of international contests should be regarded as probably the greatest contribution that they make. Not only are international friendships made and each country stimulated by the interchange of data, but lines of communication will be established which will make for a freer exchange of information.

In spite of our immigration laws, high tariff, views on the debt question and our general policy of aloof isolation, there are many in this country who have a most friendly interest in the affairs of our neighbors from across the sea and who are more than glad to establish personal contacts with the men who have been responsible for the building up of the aircraft industry in Europe. We are sure that in extending a hearty welcome to the visitors who have come over for the New York Air Races and the Schneider Cup, AVIATION is voicing the feeling of the whole American aviation community.

Good Sportsmanship

A POINT about this years' Schneider Cup races has not been made clear. One of the conditions of the competition is that in order to secure permanent possession of the Trophy a country must win it three times within a period of five years. It was won by the United States in 1923. Last year the race was scheduled but because of the wrecking of the Gloster entry there was no competition. If the United States had wished to claim a leg on the cup, it could have done so, but this opportunity was not taken advantage of and the cup will have to be won twice more before it is possible to lay claim to it permanently.

This act of good sportmanship has gone far toward creating a friendly spirit among the contestants this year and is again mentioned so that in the future, a precedent for similar exigences may be recalled.

Engines in the Schneider Cup

THE coming race to be held at Baltimore for the Schneider Cup is destined to prove of the greatest technical interest from many standpoints. Not only is it to be a speed test of the most recent seaplane designs of three different nations, all advanced in aeronautical development, but the contest is such that many aspects of airplane design are to be put to trial.

In reviewing the details of the entrants of the three nations participating in the race, England, Italy and the United States the most striking feature apparent is the fact that, in spite of two British entries, one Italian and probably four American, if last year's Curtiss racer is flown in addition to the three new racers of this year, only two engine manufacturers are represented.

The American planes are, of course, all powered with Curtiss engines, but the interesting fact is that the Italian Macchi is also powered with a Curtiss engine. With both the British seaplanes powered with the Napier "Lion", the Schneider Cup race, as far as power plants are concerned, evolves itself into a contest between the products of two of the world's greatest aero engine manufacturers.

Assuming reasonable reliability in the power plants in all the entries, and neglecting the human element in piloting, refinement in aerodynamic design in the entries of the three nations is to play a most significant part in determining the holder of the world's seaplane speed honors. Though it is impossible at this time to even conjecture upon the probable winner of the race, so excellent, from all appearances, are the lines of each of the seven entered seaplanes, it will seem that a very close race will be run in spite of the differences in power of the engines used. It is not known exactly the power developed by the special racing Napier engine, but it seems possible that the foreign entries may prove the highest powered of all, while the D12 engine in the Italian entry must be considerably less. With these considerable differences in power, the effects which refinement in aerodynamic design will have upon the performances set up by each individual plane will be watched with the closest interest.

The Status of the Royal Air Force

By C. G. GREY
Editor, The Aeroplane

So many attacks have been made on the principle of the Royal Air Force that AVIATION *requested Mr. Grey to cable his opinions of the present status of British aviation. The following cable is dated Sept. 29, 1925.*—EDITOR.

FOR their own ends, the politically minded section of the British Navy is endeavoring to persuade the world that the Royal Air Force is a failure and the Navy is capable of running an Air Service alone. It is a fact that the Royal Air Force is proving more and more a success as it grows older. The Air Force has been officially recognized by

Charles C. Grey

Parliament as the first line of defense of the British Empire, and one section of it has been organized specially for home defense in India. The Pathan tribes on the northwest frontier have never been so quiet as they have been since Air Power has been used against them and the cost of keeping them quiet has been far less than it was in the days of punitive expeditions on foot. In Iraq, raiding tribes from the desert and from the hill country have been kept in check at a fraction of the cost of the days before Air power was employed, and Sir Samuel Hoare's motto "control without occupation" has been more than justified. The spirit and discipline of the Air Force is as high as that of the British Army before the great war.

Air Force the Premier Service

The British public has taken the Air Force to its heart and on all public occasions detachments of the R.A.F. are received with greater enthusiasm than those of any of the other services. During the past few weeks over one million people have visited the great stadium at Wembley to see the military tattoo and the applause which greets the appearance of the men of the Royal Air Force shows that they are the chief attraction for the British public.

The standard of skill in the air of the R.A.F. pilots is unsurpassed in any country in the world, and the way in which their airplanes and motors are maintained shows that as mechanics the men of the Air Force are fully up to the highest standard of British operative engineers. The science of air fighting and of air attack on ground objectives has been developed by the R.A.F. to a point far ahead of 1918, and every effort is made by the senior officers of the R.A.F. to cooperate cordially with the two older services.

No difficulty is found in cooperating with the Army which recognizes the necessity for Air Cooperation in its own work while also recognizing that the Air Force has its own strategy and tactics apart from the Army. The only difficulty is experienced in cooperating with the Navy. Naturally the Navy resents being deprived of its position as the first line of defence and is endeavoring to regain its own naval Air Service. During the war 1914-18 the Navy treated the Royal Naval Air Service with scorn and refused to accept the help of its own aviators and lost many ships and hundreds of men and thousands of tons of food stuffs and munitions in consequence.

Navy Has Fleet Arm

The policy of the Air Ministry seems to be to give the Navy enough rope to hang itself, consequently a section of the Air Force has been organized as the Fleet Air Arm. This is intended to work with the Fleet and to be used entirely for the work of the Fleet at sea. Scouting, gun spotting, torpedoing and bombing numbers of Naval officers are being trained to fly at R.A.F. schools and others are being trained as observers by the R.A.F. Thus, in due time, the Fleet Air Arm will be manned entirely by Naval officers and then if the British Fleet comes to grief through inefficient or incompetent Air work the Navy will not be able to blame the Royal Air Force.

Little Chance Against Aircraft

The acute brains which are responsible for this political strategy see that fleets of old-fashioned ships will stand a very small chance against aircraft such as will be developed during the next few years, and that whether our next war is to be fought over the islands of the Pacific or over the plains of Central Europe or both, the Air Force will be in a better position to conduct its own war in the air if it has a perfectly free hand, and is not hampered by having a large section of its available men and machines attached to the Fleet and condemned to take part in operations planned by Naval officers whose outlook has not expanded since Nelson's day.

So long as the Air Force controls the coast patrols, and therefore is able to protect the shipping on which the food and commerce of the British Empire depends, it is quite willing to let the British Navy run its own little Fleet Air Arm. Doing so is only equivalent to making a man healthier by an operation which cuts off an unhealthy part of his anatomy.

Air Force Independence

The success of the Royal Air Force as a fighting service will not be affected if the Navy has its own Fleet Air Arm, or even if the Army has its own Army cooperating flying corps. The Navy carries on board ship, infantry soldiers who are called marines. The engineers of the Army have quite a fleet of steamboats and motorboats, and the Royal Air Force trains its own mechanics to drill as soldiers and to use rifles in defense of their airdromes. It trains other mechanics at the coast patrol stations to handle motorboats as tenders to seaplanes, therefore each service may have some of the characteristics of the other without in the least losing its own independence in the next war.

The first attack will come from the air and the first great battles will be fought in the air irrespective of what the Army or Navy may be doing. That alone is sufficient reason for the existence of a separate Air Force.

The Builders of the Gloster-Napier III

Schneider Entry by Designers of British Standard Pursuit Plane

ONE of the most determined competitors for the much coveted Schneider Trophy is the Gloucestershire Aircraft Company, who would have contested the cup last year with their "Gloster II" but for an unfortunate mishap to the machine while undergoing its trial flights.

The Gloucestershire Aircraft Company is "young in years but mature in workmanship and design." It is barely 10 years since the British government, in view of the excellence of the equipment of the Company's works at Sunningead, Cheltenham, both for dealing with wood and metal, took over the entire works for aircraft construction. The first products were "Bristol Fighters" and other well tried machines. A very high level of production was rapidly attained averaging 20 machines per week, and the workmanship of the firm gained an excellent repute.

It was very soon decided to form a subsidiary aircraft company to the parent concern and in 1917 the Gloucestershire Aircraft Company was organized with D. Longden and A. W. Mortyn as joint managing directors.

At the conclusion of the war when Government orders ceased, it became necessary to adopt a new policy, and it was at this critical juncture that the Company embarked upon aircraft manufacture to their own designs. Aircraft construction in peace time was still a questionable commercial proposition, but with a very high reputation for workmanship and production already firmly established, signal success was achieved.

The Gloucester "Mars I"

The Company, in 1921 engaged H. P. Folland, a designer of great experience and well known in the aviation world. He had previously been with the Royal Aircraft Factory at Farnborough, in 1922, where he was later appointed Assistant Chief Designer. Mr. Folland brought with him a long experience in successful designing which bore early fruit in the now famous Gloster "Mars I" or "Bamel," which broke numerous records in 1921. It is interesting to note that this machine started on floats has been successfully used as a training machine for the "Gloster III" pilots and has attained a speed of 200 m.p.h. The "Bamel" was followed by the "Gloster I" which won the Aerial Derby in 1922 and 1923, the "Gloster II," and now comes the "Gloster III," the performance of which in the race for the Schneider Cup will be watched with much interest. All these racing machines were fitted with Napier engines.

Military Types

But apart from these experimental machines of the fast racing type, the Gloucestershire Aircraft Company's present list of standard types now produced is a formidable one. It includes the well known Mars series of machines of all classes now numbering I to XIV, as well as the still later types such as the "Grouse I," "Grouse II" (a new and remarkably efficient training machine with Lynx engine), the "Gannet," (single seater sporting machine) and the now famous "Gorcle" single seater fighter which forms today a prominent feature of the Royal Air Force. Still later, the firm produced two remarkable single seater fighters with the Bristol "Jupiter" and Napier "Lion" engines respectively, the "Gamecock" and the "Goldcrest" of which however details may not yet be disclosed.

The designing staff of the Company has been productive of designs of all classes of aircraft including commercial types. A specialized study has however for some time now been made of the high speed fighting scout in view of the ever increasing importance of this class of machine for military and naval defense. The company is at present engaged in very interesting experiments on all steel construction which promise some surprising results in the near future. The remarkable growth of the firm has necessitated the opening of new works at Brockworth, where is situated the spacious aerodrome of the firm.

The Glouster-Napier III

The "Gloster-Napier III" is a racing seaplane of the biplane type, and is probably the smallest machine for its horsepower yet produced on floats. It is fitted with a Napier "Lion" Engine modified for racing purposes with direct drive action.

The body of the machine is of oval shape of small dimensions, the type of construction known as monocoque, with wooden longitudinal members and an outer covering of three-ply wood.

The streamlining of both engine and machine is little short of perfection, every care having been taken to reduce the resistance of the body to a minimum. The size of the body has, in fact, been determined by the bare amount of space required for the pilot to be seated comfortably.

The wings are built up of spruce spars and ribs, and the fabric has been fixed by a special method to withstand the suction produced at such high speeds. There are but two interplane struts, one on each side of the body, of "I" section.

Capt. H. S. Broad, Pilot of the British Gloster-Napier III in the Schneider Cup Race.

The propeller is of solid duralumin, wooden propellers not being capable of standing up to the work required.

The radiators are of a special type, built into the leading edge of the wings near the body, in such a way as to give the minimum amount of resistance.

The floats are of duralumin construction of a streamline section, and are attached to the body by special steel streamline struts and wires.

The streamlining of all joints and projections has been carried out with the greatest care in order to obtain the high speed required for such a race as the Schneider Cup of 1925.

Only those designers who have attempted to produce very high speed machines can realize the problems which arise owing to the lack of information which exists as to the behaviour of the flow of air over wings and body at such high velocities. These problems have been successfully overcome in the "Gloster-Napier III," which has proved to be easily handled, not only in the air, but also on the water.

The Supermarine Successes

A Company Engaged for Thirteen Years in Seaplane Design

The Supermarine Aviation Works, LTD, was established in 1912 at Woolston. Several experimental high speed hydroplanes were built which were followed by a flying boat hull of circular construction on which was erected a wing superstructure with central engine mounting, which was one of the first flying boats actually produced in England and was exhibited at the Aero Exhibition at Olympia in 1913. The following year was occupied chiefly with experimental work and the improvements in design of sea-going aircraft.

Following on the outbreak of war, advantage was taken by the authorities of the location of the works to repair and to recondition at Southampton damaged machines which had been returned from the front to the R F C. On the completion of this work they were rapidly returned via L'Havre for further service in the field. This work was expeditiously carried out and was of considerable benefit owing to the small number of aircraft then available.

Naval Aircraft Construction

Subsequently, the area of the works was considerably increased and additional shops were erected and the firm then became controlled by the Government. Practically all the experimental and design work on flying boats was carried out for the R N A S, in addition to production orders for School flying boats and fighting seaplanes.

The first flying boat Channel Service was opened in 1919 with Supermarine Channel type passenger machines. This was extended to France during the Autumn of that year at the period of the great coal strike and a large number of passengers were conveyed betwen England and the Continent. A demonstration of the machines used on this service was also given from the Royal Pier, Southampton.

In September, 1919, the Supermarine Company entered a flying boat for the Schneider Cup race at Bournemouth, the hull of which was, after the race, presented to the Imperial College of Science, South Kensington, as an example of English flying boat construction. The result of the Supermarine activities during this year fully proved the possibilities of the design of the machines which they had constructed, and in 1920 Supermarine Channel type flying boats were exported to Norway, by the order of the Royal Norwegian Naval Air Service; also to a private Norwegian Company who established and ran a mail route with Supermarine machines with great success. This was the first aerial route to be established on the coasts of Norway. Following this Supermarine passenger flying boats were exported to Bermuda and with them a passenger service was established at Hamilton.

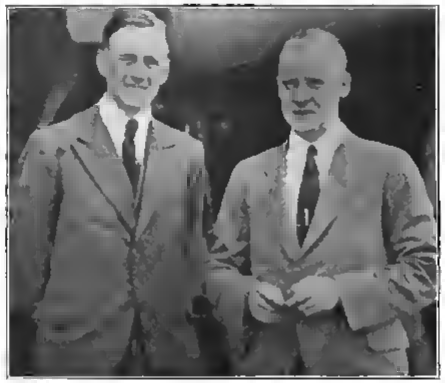
First Commercial Amphibian

In September of the same year the Supermarine Aviation Works, Ltd., produced the first Commercial Amphibian flying boat, and this was entered in the Air Ministry competition at Martlesham and Felixstowe where it was awarded a prize of $38,000 on account of its remarkable reliability, durability of construction and excellence of design and seaworthiness.

In order to help keep the boat-building department of the works fully employed, a motor boat department had been established and a high class design motor boat produced which was exhibited at the Motor Boat Exhibition at Olympia during March, 1921. Subsequently an order was received for one of these boats which was specially designed and constructed for the use of H. M. King George V and Royal Family for service with the Royal Yacht 'Victoria & Albert'.

During this period the design department of the firm was kept fully employed, and in 1921 produced the first specially designed deck landing flying boat which was the forerunner of the firm's well known "Seagull" type of machine. Flying boats of this type and also of the Channel type Training and School machines were exported during 1921 to Japan, New Zealand, Fiji Islands, Trinidad, British Guiana, Chile and Sweden. In the Fiji Islands, Trinidad, the Delta of the Orinoco river, and New Zealand, the Supermarine flying boats were the first aircraft of any kind to be seen by the inhabitants of those particular parts of the world.

In 1922 the "Seagull" type of deck landing flying boat was ordered in large numbers by the British Air Ministry. In July, a single seater machine known as the "Sea Lion" was sent to Italy to compete for the International Schneider Cup and was successful at Naples in regaining this trophy for England on August 12th, 1922, being piloted by Capt. H. C. Biard, the firm's well known test pilot. This was made possible by the cooperation of Messrs. D. Napier & Son, who loaned one of their 450 hp. Napier 'Lion' engines. On the occasion of the race the machine succeeded in breaking all previous records for flying boats and as a result the firm was awarded the first official world's records granted by the F.A.I. for marine aircraft. As a result of this success the machine was purchased by the British Government.



Capt. H. C. Biard (left), Who Will Pilot the British Supermarine-Napier S4 Monoplane in the Schneider Cup Race, and Mr. J. R. Mitchell, the Designer of the Plane.

In 1923, still further "Seagull" type machines were ordered by the Air Ministry for cooperation with Naval aircraft carriers. In course of construction at this time were two new types of twin engine flying boats of large dimensions to the order of the Air Ministry and about the middle of the year a new type of Commercial Amphibian flying boat was produced known as the "Sea Eagle". This was entered in the King's Cup race, and as such was the only flying boat amphibian to take part in the competition and was regarded as a novelty at the inland towns which were visited during the course of the race. This type of machine was used to open the first regular Flying Boat service run by the British Marine Air Navigation Co., Ltd., to the Channel Islands and France.

1923 Schneider Entry

In September the "Sea Lion" machine was entered for the Schneider Cup race at Cowes, Messrs. D. Napier & Son, again supplying an engine. The "Sea Lion" finished third being behind Lieutenants Rittenhouse and Irvine who were flying machines which had obviously had greater attention paid to them from a racing point of view than any others previously seen in England.

In November, 1923, Mr. Hubert Scott-Paine entirely severed his connection with the firm in order to devote himself exclusively to the development of aerial transport in connection with the British Marine Air Navigation Co., Ltd., which company is now merged with the Imperial Airways, Ltd. The whole of Mr. Hubert Scott-Paine's interests were taken over by Commander James Bird who is the present Managing Director. The Chief Engineer and Designer is R. J. Mitchell, and the chief test pilot is Capt. H. C. Biard.

The beginning of 1924 saw considerable extensions in the way of accommodations for the largest types of flying boats which were under construction. The first of these is the "Swan" which was successfully launched and flown on March 25th, and is the largest twin engined amphibian flying boat in the world, designed and constructed to the order of the British Air Ministry. Following this, another new type of large twin engine flying boat was delivered to the British Government.

During the first half of 1925, twelve Supermarine amphibian bombing flying boats of a new type and design were constructed to the order of the Spanish Royal Naval Air Service. This type is known as the Supermarine "Seerab" bombing and Reconnaissance Amphibian flying boat and has been employed successfully by the Spanish Royal Naval Air Service in the campaign against the Riffs. It is the first amphibian flying boat to be used on active war service in any part of the world.

The Southampton Type

At the beginning of this Autumn the whole of the energy of the works was concentrated upon a machine of an entirely new design for the Air Ministry. It was completed and delivered in the record time of 7½ months and being on the secret list of the Air Ministry, no details may be given with the exception to stating that it is a twin engined machine and is named "Southampton" after the town in which it was built. Since delivery, extended cruises have been made with this machine to the Firth of Forth and down to the Scilly Isles, which proved most successful in every way. Later, Sir Samuel Hoare, Secretary of State for Air, Sir Geoffrey Salmond and Sir John Salmond, made a flight in the "Southampton" of two and a half hours duration and expressed their complete approval of the behavior of the boat both on the sea and in the air. The factory is now fully employed on a production order from the Air Ministry for these machines.

In addition to this the float type seaplane was constructed for this year's Schneider Cup race. This is a new departure, as the activities of the firm in the past have been confined exclusively to the design and building of flying boats.

A contract has recently been placed by the Australian Government for six of the well known Supermarine "Seagull" Fleet Spotting Deck Landing Amphibian Flying Boats.

The Supermarine Napier S4 was loaned by the Air Ministry to compete for the Schneider Cup.

Instructions to construct this machine were given March 18th, 1925. The first flight made on August 25th, 1925. The machine is an entirely new type of design embodying a number of extremely novel features. In view of these novelties a great achievement has been gained in designing and constructing the machine in five months.

The machine is a cantilever monoplane in which entirely new methods of construction have been incorporated which show great promise for future design and it is only these new methods of construction which have made it possible for the design to be carried out. The wing is built all in one piece. The wing section is one which has been recently developed by R A F, Farnborough and a trial wing was constructed and tested to destruction there. The tail unit, including both fin and tail plane, are built in one piece with the fuselage. The cantilever chassis is made flexible by use of high tensile steel members absorbing landing shocks very efficiently. Flap gears reduce the landing speed. The floats are made of wood. Cleanliness of design has been the first consideration. All the controls, etc., are internally operated thus reducing head resistance. Every part is covered with either wood or metal and no fabric whatever is used. The machine is fitted with wing radiators and metal propeller. A special oil cooler of novel design purposely developed for high speed aircraft is used.

The Engine

The engine is special direct drive Napier "Lion". The power has been greatly increased and weight reduced to such an extent that in this respect Messrs. Napier claim an advantage over all other aero engines. Bristol Gas Starters are used for starting.

The pilot of the Supermarine entry will be Capt. H. C. Biard.

In addition to Capt. Biard, the Supermarine team will be represented by R. J. Mitchell, our Chief Engineer and Designer, who is personally entirely responsible for the design of the S4; A. Powell, in charge of erection, H. B. Pickett, engine mechanic, G. H. Broom, rigger and H. M. Grumes, launchman.

Comdr. James Bird, Managing Director of the Supermarine Aviation Works, Ltd.

Italian visitors at Baltimore. Left to right, Pedetti (Mech.), Ricaddo Morselli, Muzio Mecchi, Mario Castoldo, designer, Cerutti (Mech.), Trovanni de Briganti, and Fiegelori.

The Makers of Napier Engines

Century Old Engineering Concern in First Rank of Aero Engine Manufacturers

The firm responsible for the motive power of both the British entrants for the Schneider Trophy is D. Napier & Son Ltd. whose works are in London, England.

Established in 1808, D. Napier & Son have for over a century been engaged in engineering of the highest order and in everything they have undertaken they have excelled.

Their earliest years were spent in designing and manufacturing coining presses and machinery for weighing Bullion and coin. These machines required the greatest accuracy in manufacture so as to be capable of detecting minute differences in weight. Napier machinery is to be found today in the Mints of London, Leningrad, Calcutta, Belgium and France, and the Bank of England also uses them.

In 1898 the Napier Company first turned their attention to the internal combustion engine as a means of locomotion. Surmounting all the obstacles and difficulties experienced by the pioneers of motoring. The first Napier car was produced in 1899, and since then the Napier Company have been producing motor carriages which have gained for themselves a world wide reputation, and have enhanced the renown of the British motor industry all over the World. For racing the Napier Company probably hold more trophies than any British car.

It is not surprising, therefore, to find that when the need for aero engines arose, the Napier Company should turn their attention to this highly scientific branch of engineering.

The Napier "Lion"

It was in 1916 that ideas for the now famous Napier "Lion" engine were first evolved, but owing to the large amount of special war production the Napier Company were then engaged upon for the British Government, it was not until 1918 that the first engine was tested by the British Air Ministry.

Development stages of the 450 hp. Napier—which had received the designation of "Lion" from the British Air Ministry—were carefully and quickly dealt with, and at once it gave evidence of the position it was to reach and the popularity it was destined to obtain.

The Napier "Lion" is of novel design making it particularly compact, a great advantage to aeroplane designers as it facilitates installation in aircraft. The twelve cylinders are arranged fan shape, in three blocks of four cylinders each. This means that a short stiff crankshaft is used, reducing vibration, increasing reliability and lessening wear and tear.

Probably the most remarkable feature of the Napier engine is its light weight in proportion to power developed, consistent with extraordinary reliability. It is this feature, combined with absolute reliability, economy in running, guaranteed horsepower and care in construction, which has created such a remarkable demand in all parts of the world for the Napier. The standard Napier "Lion" used in service machines which develops from 470 b.h.p. at 2000 r.p.m. weighs approximately 2 lb. per hp.

The engines which are fitted to the two competitors for the Schneider Trophy have been specially modified for racing purposes.

Economy in Operation

The Napier engine is remarkably economical. The fuel consumption at full load averages the low figure of 0.49 per b.h.p. hour while the oil consumption on a similar basis is 0.025 lb. per b.h.p. hour.

Before an engine is officially accepted by the British Air Ministry it has to undergo very severe tests under the supervision of Inspectors of the Air Ministry. The 450 hp. Napier engine has run over 734 hours of testing under the official type test conditions. The latest test was of a particularly strenuous nature. The engine ran for 104 hr. without any part being changed throughout. The type test included ten non-stop periods of ten hours duration each at 2000 r.p.m. at an average b.h.p. of 425. This was followed by ten minutes slow running at 500 r.p.m. The engine was then opened up

H. T. Vane, Managing Director of D. Napier and Son Ltd., Manufacturers of the Napier Aero Engines.

to 2310 r.p.m. and was run for one hour at this speed. A further hour at 2200 r.p.m. was run at full throttle, the engine developing approximately 500 b.h.p.

This is typical of the many tests to which the Napier engines have been subjected. Almost from its inception the Napier "Lion" was a success.

A String of Successes

As early as January, 1919, a DH9 airplane fitted with Napier engine, probably the first Napier ever constructed, reached a height of 30,500 ft. At the time, this was probably a world record, but being a service machine no claim was made for it. Since that date many honors have come to the Napier engines.

The Aerial Derby has been won by Napier engined machines in 1919, 1921, 1922 and 1923. On the last three occasions, the engine was fitted to a Gloster machine. In 1923 two circuits totalling 200 miles were flown at an average speed of 192.4 m.p.h. This is the last occasion on which the Aerial Derby has been organized.

Again, it was a Napier engined Supermarine flying boat which wrested the Schneider Trophy from the Italians at Naples in 1922. Captain Biard was the successful pilot on that occasion and will be flying the Supermarine-Napier flying boat at Baltimore this year.

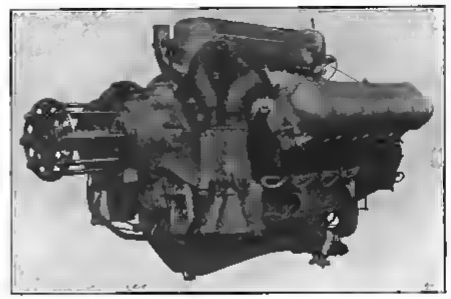
Another remarkable achievement as evidence of the reliability of the Napier was the flight by Major Zanni the Argentine airman. Flying a Napier engined Fokker machine, Major Zanni travelled from Amsterdam to Tokio, a distance of 10,000 miles, in 22 days flying, without, as he says, having to touch his engine at all.

Owing to the demand for Napier engines for Naval and Military purposes, it has not been possible to enter these engines for records, but in June, 1925, an ordinary standard Fokker two seater fitted with one Napier engine secured four world records at Amsterdam. This machine, carrying a load

of 1102 lb. attained an average speed of 165.7 m.p.h. over 100 km. and 164.7 m.p.h. over 200 km.

Napier engines have been as successful on commercial service as they have been in the Royal Air Force and for racing. One Napier engine in use by Imperial Airways has covered over 170,000 miles (1700 hours flying) and is still in service.

It is only by the greatest care and microscopical accuracy in the manufacture of every detail in the Napier engines that such reliability as they possess can be obtained. From the



The Napier "Lion" 450 hp. aircraft engine, a W type with three banks of four cylinders and geared propeller drive.

time the metal in its rough state arrives and is tested chemically and physically at the works, to the time the complete engine is assembled, it passes through hundreds of hands, and after each operation it is checked and tried.

Manufacturing Thoroughness

As indicating the amount of skilled work necessary in the manufacture of the reliable Napier engine, the following nine weights of interest:—

Part	Rough weight lb	Finished weight lb	No. of operations
Master Con. Rod	24½	5¼	76
Crankshaft	150	47	80
Crankcase	150	80	80
Cylinder	100	18*	58
Rear End Cover	18	10½	50
Cylinder Heads	76	23	85
Airscrew Shaft and Crankshaft pinions	43	31	40

*(Complete with water jacket)

It is not surprising to anyone who has seen the meticulous care taken in every detail to find the Napier Company able to record such wonderful achievements. Napier success throughout its long history has been gained through consistent development and improvement—never resting satisfied with what has been turned out before and embodying only the best materials and high grade workmanship in the construction of their products.

The British Representatives at Baltimore

The Royal Aero Club appointed a special Schneider Cup Race Committee to deal with all points in connection with the race and have appointed Capt. C. B. Wilson to proceed to America with the teams as the official Aero Club representative. The Royal Aero Club have done everything possible to assist in securing the services of a reserve pilot and are helping financially with a grant toward expenses. The Admiralty have arranged whereby H.M.A. "Valerian" has been detailed to be present at Baltimore before and during the race to give every possible help and assistance to the British representatives.

Captain C. B. Wilson, M.C.

Captain C. B. Wilson is the Royal Aero Club's representative in charge of the British team in America. He is one of the earliest members of the Royal Aero Club, joining it in 1911. He joined the 10th Hussars and served in India. He went to the war in 1914 with the 10th Hussars and transferred to the R.F.C. in 1915. He took a course at the Central Flying School, Upavon.

He formed the 15th Squadron R.F.C. and went to France with them the end of 1915. He was was shot down in 1916 and remained a prisoner of war until the end of hostilities.

He has always shown a keen interest in gliding and had a glider in the Itford competitions in 1922.

Captain Wilson presented a prize at the last Lympne meeting.

He is a member of the racing committee of the Royal Aero Club.

Mr. H. P. Folland

Mr. H. P. Folland who is designer in chief to the Gloucestershire Aircraft Company, was with the Royal Aircraft Factory (now the Royal Aircraft Establishment) at Farnborough, before the war and was assistant designer there to Captain Geoffrey de Havilland. He had considerable to do with the designs of the famous B.E. machines and after that he designed the S.E.5a machine which was one of the best fighting scouts in the Royal Air Force at the end of the war and is still used for sky writing and many other purposes. In 1917 he joined the newly formed British Nieuport Company. Here he designed the Nieuport Nighthawk which was ordered by the Air Ministry in large quantities for the 1919 programme. Owing to the Armistice the machine was never used in quantity in the Royal Air Force.

After the War he designed a bomber triplane called the "London" and also built the Nieuport Goshawk which broke the then British speed record with a speed of 166 m.p.h. In 1921 he joined the Gloucestershire Aircraft Company, and in six weeks he designed and built the world famous Bamel which on its first flight won the Aerial Derby of 1921. It won again in 1922 and 1923. In 1924 besides winning, it made various speed and height records. As chief designer to the Gloucestershire Company, he has produced several machines, among

Maj. J. S. Buchanan, who is in this country to represent the British Air Ministry at Baltimore during the Schneider Cup Race.

them being the Gloster Grebe with which several squadrons of the Royal Air Force are now equipped. He has also produced two exceedingly interesting machines, the Gamecock and the Gawcock for the Royal Air Force. He designed a machine for the Schneider Cup last year which was prevented from entering by an accident. For this year's Schneider Cup Race he has produced the Gloster Napier III on which, with the Supermarine Napier S4, Britain's hopes of regaining the Schneider Cup are centered.

Mr. R. J. Mitchell

Mr. Mitchell was born at Stoke-on-Trent in 1895. He was engineer apprentice at Messrs. Kerr, Stuart & Co., Ltd., of Stoke-on-Trent and later assistant engineer. He joined the Supermarine Aviation Works in 1917 and was appointed chief engineer and designer in 1920.

Among the machines for which Mr. Mitchell has been responsible can be mentioned, the Supermarine amphibian flying boat which won the second prize in the Air Ministry competitions held at Martlesham in 1920. The Supermarine "Sea Lion" which won the Schneider Trophy in 1922; the Supermarine "Seagull" which has been used in large numbers by the Air Ministry as deck landing naval reconnaissance machines, the Supermarine "Sea Eagle" the first civil amphibian flying boat, the Supermarine "Swan" the first twin-engined amphibian flying boat designed for civil purposes; the Supermarine "Sparrow" light aeroplane.

He also designed the Supermarine "Southampton", the latest type boat built for the Air Ministry. This has proved very successful and was described by the Secretary of State for Air after a recent flight as 'one of the best flying boats Great Britain had ever had'.

His latest design is the Supermarine-Napier S4 which has been entered for the 1925 Schneider race at Baltimore.

Bert Hinkler, the reserve pilot of the British Schneider Cup team.

Mr. Bert Hinkler

Mr. Bert Hinkler comes from Australia, of which he is a native. During the War he did good work in an Australian Squadron. After the War he purchased a Sopwith Pup with which he intended to fly to Australia but was prevented by the authorities from doing so as they considered the machine unsuitable. He then bought an Avro Baby and in June, 1920, he started from Croydon to fly to Australia. He went to Turin without a stop, a distance of 700 miles and then, owing to troubles in the East he was advised he could not fly through Iraq and so he flew back to England.

After that he took the machine to Australia and flew from Sydney to Bundaberg, a distance of 800 miles non stop which is a record for a light aeroplane non-stop flight which still stands. On his return to England he became chief test pilot to A. V. Roe & Co., Ltd., and has successfully tested numerous machines.

He was the first pilot to take the 1,000 hp. Napier Cub into the air. This engine was fitted into the Avro Aldershot and Mr. Hinkler flew it with marked success. He has taken part in all the big air races in England in the last few years and in 1924 won the Grosvenor Challenge Cup at Lympne on his Avro Avis. He tours about the country by air carrying his wife as passenger and has probably done more cross-country flying on light aeroplanes than any other pilot. This will be his first experience with real racing machines, but his performance on other types leaves little doubt that he has the proper touch for really fast aircraft.

Captain Hubert Broad

Captain Hubert Broad will pilot the Gloster-Napier III machine for Great Britain. He learned to fly in 1915 and joined the R.N.A.S. at Dunkirk. Later he returned to England and joined 46 Squadron R.A.F. He went to France and was wounded in combat over Cambrai. He brought down six enemy aircraft and returned home just before the Armistice to act as instructor in England. Was awarded the A. F. C.

He was with Messrs. A. V. Roe & Co., for about a year and then went to the United States flying many different types of machines. On his return he joined De Havilland, Ltd., and has been with them since. He has flown all types—large commercial aeroplanes to small light machines. He has flown in all, over 75 different types of aeroplanes.

He was loaned last year to the Gloster Aircraft Co., for last year's race and was testing the machine which had been entered, when, owing to a damaged float, the machine sank. Captain Broad had a narrow escape on this occasion.

This year he has again been selected to pilot the Gloster-Napier III.

Captain H. C. Biard

Captain H. C. Biard who will pilot the Supermarine-Napier S4 for Great Britain in the Schneider Trophy at Baltimore on October 24th, is 35 years of age.

In 1912 he first obtained his pilot's license. He is probably the only pilot in England today who obtained a certificate as long ago as that, and is still regularly flying. In his early flying days, Captain Biard was connected with Mr. Claude Graham White, at Hendon. During the war he served with the R.N.A.S. and since then has been employed as test pilot to the Supermarine Aviation Works, Ltd.

Captain Biard first flew in the Schneider competition in 1922. The race was at Naples and a Supermarine-Napier flying boat was the only British entry. On this occasion, Captain Biard flew a splendid race and was successful in bringing the trophy to England.

In 1923 Captain Biard was again the only British competitor to complete the course and on this occasion he was flying the same machine as he used in the previous year. Owing to the superiority of the American machines the trophy on this occasion was won by the U.S. Navy.

The Curtiss Army Racer R3C-2 equipped with floats for the Schneider Cup Race. This is the plane on which Lieutenant Bettis won the Pulitzer Trophy. Lieutenant Doolittle, who is to pilot the seaplane is standing on the float.

The United States Schneider Cup Entrants

Army and Navy Well Represented

AMERICA is to be very well represented at Baltimore in the Schneider Cup race. The three Navy seaplanes will be piloted by Lieutenants Cuddihy, Ofstie and Conant. Lieutenants Cuddihy and Ofstie will fly the two new Curtiss R3C2 racers, while the "stand-by" plane, being the Curtiss racer intended for last year's Schneider Cup race will be flown by Lieutenant Conant. The Army seaplane, the Curtiss racer on which Lieutenant Bettis won the Pulitzer Race last week, converted like the others, into a float seaplane, will be flown by Lieutenant Doolittle.

Lieutenant George T. Cuddihy, U. S. Navy

Lieutenant Cuddihy was born at Alba, Mich., Feb. 22, 1898. He entered the Naval Academy in 1914 graduating in 1917, and was on the U.S.S. Mississippi until June 1921, when he went to the Naval Air Station Pensacola, Fla. for aviation training.

When he left Pensacola in December 1921 Lieutenant Cuddihy went to the Aircraft Squadrons with the Battle Fleet on the West Coast. In June 1924 he left the West Coast and joined the Naval Air Station, Anacostia, his present duty.

On Oct. 25, 1924 Lieutenant Cuddihy was a member of the team of Navy pilots taking part in the Naval Air Meet at Bay Shore, Md. In this meet he established a world's record for seaplane speed of 189.82 m.p.h. in the Navy CR3 seaplane.

He commanded the high score aviation gunnery unit for the years 1922 to 1924.

Lieutenant Cuddihy will pilot a Navy R3C1 seaplane in the Schneider Cup Race to be held near Baltimore on Oct. 24, 1925.

Lieutenant Ralph A. Ofstie, U. S. Navy

Lieutenant Ofstie was born at Eau Claire, Wis., Nov. 18, 1897. He was appointed a Midshipman in 1915 and graduated from the Naval Academy in June 1918, an Ensign. He was assigned to the destroyer Whipple and engaged in coastal convoy and anti-submarine work off the west coast of France, specially from Brest, France.

After the war he continued on destroyer duty on the West Coast of the U. S. until December 1921, when he went to the Naval Air Station, Pensacola, Fla. for aviation training. In August, 1921, he received the rank of Lieutenant. Junior Grade. In June 1922 was assigned to duty with Fighting Plane Squadron One, Aircraft Squadrons Battle Fleet, where he remained until February 1924, when he came to the Bureau of Aeronautics, Navy Department, for duty in the Plans Division of the Bureau and as a test pilot—his present duties.

On Oct. 25 1924 he was a member of the team of Navy pilots engaged in the Naval Air Meet held at Bay Shore, Md. In this meet Lieutenant Ofstie established three world's seaplane speed records, with a Navy CR3 Seaplane. They were: Speed for 100 km. and 200 km. 176.25 m.p.h. Speed for 500 km. 171.14 m.p.h.

Lieutenant Ofstie will pilot one of the Navy R3C1 racing seaplanes in the Schneider Cup Race to be held near Baltimore on Oct. 24, 1924.

Lieutenant (Junior Grade) Frank H. Conant, U. S. Navy

Lieutenant Conant was born at Annapolis, Md., Nov. 13, 1898. He entered the Naval Academy in 1918, graduating in 1919 and sailed to the U.S.S. Oklahoma.

In May 1921 he left the Oklahoma and went to the Destroyer Force with the Atlantic Fleet and in June 1922 he went to the Naval Air Station Pensacola, Fla. for instruction in aviation, receiving his present rank of Lieutenant, Junior Grade, in December 1922. In February 1923 he went to the Aircraft Squadrons Battle Fleet on the West Coast, remaining there until March 1925 when he joined the Bureau of Aeronautics, Navy Department, his present duty. Lieutenant Conant will be the pilot of the "stand-by" plane for the Schneider Cup Race in a Navy R3C2.

Lt. Comdr. Homer C. Wick, U.S.N., Representative of the Bureau of Aeronautics in charge of the Navy entries at Baltimore.

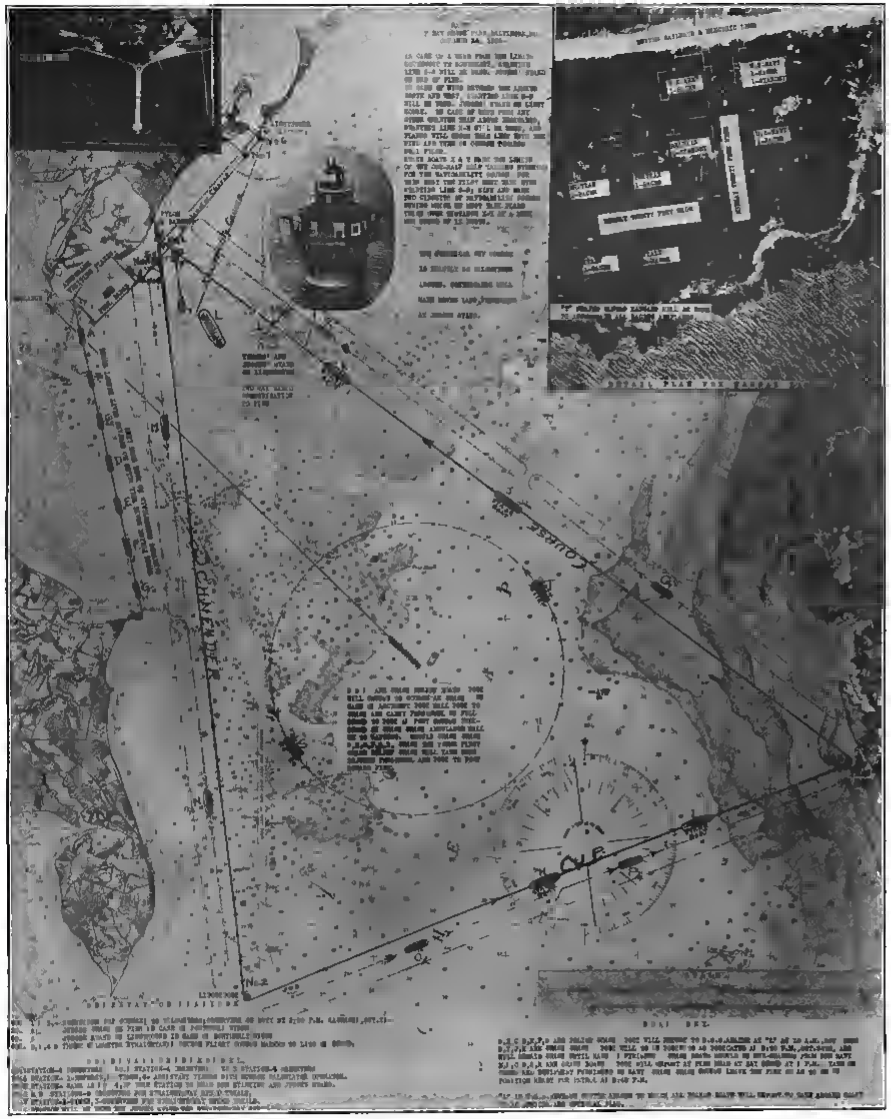
Lieutenant James H. Doolittle, A.S.

First Lieut. James H. Doolittle, Air Service, was born at Alameda, Calif., on Dec. 14, 1896.

Educated at the Manual Arts High School of Los Angeles, Calif., and the University of California, Lieutenant Doolittle has also spent a considerable time in advanced mathematical and aeronautical study at the Department of Aeronautics at the Massachusetts Institute of Technology. His military service dates from Oct. 8, 1917, and with the flying rating of airplane pilot, dated March 5, 1918, Lieutenant Doolittle has been responsible for many notable flying achievements, including in September 1922 a record non-stop seaplane flight from the Atlantic to the Pacific Coast in 21 hr. 20 min. flying time and 22 hr. 35 min. elapsed time for the entire flight.

Lieutenant Doolittle is a pilot of considerable ability and has carried out many valuable full scale aerodynamic investigations while attached to McCook Field, Dayton, Ohio. He will pilot the Army Curtiss R3C2 Racer in the Schneider Cup Seaplane race.

Left to right, Lts. George T. Cuddihy, U.S.N., Ralph A. Ofstie, U.S.N., and Frank H. Conant, U.S.N., who will represent the Navy in the Schneider Cup Race. Lt. Conant will pilot the "stand by" plane.



The Course of the Schneider Cup Race

The course selected at Baltimore for the International Seaplane classic this year is as nearly ideal as could be found anywhere in the United States On land-locked Chesapeake Bay, the triangular course of 50 km not only permits an open stretch of water that can be kept clear, but with Bay Shore Park as a starting and finishing point the public is given an opportunity to see the race with little effort The pier that extends out into the bay makes an ideal grand stand and the shore for miles in either direction is a natural arena from which the races can be viewed

Some Technical Aspects in Commercial Design at the Air Meet

By B V KORVIN-KROUKOVSKY

Even casual review of the airplanes assembled at Curtiss, Roosevelt and Mitchel Fields for the races, shows that development of the commercial airplane has crystallized into three distinct classes Each of these classes is represented by several competing machines and fulfills the need of some particular branch of commercial flying Probably most conspicuous and certainly most substantially established, is the class of small general utility airplanes, suitable for passenger carrying, taxi service, photography and training work This class is best represented by Waco 9, Laird "Commercial", Travel Air and Swallow airplanes

Developed in the section of the country where the airplanes were most used, in response to actual demand for better airplanes, by the people in close contact with commercial pilots, these planes represent thoroughly practical machines, well adapted to the work they have to do, as well as to the funds available for doing it. In a way they are the only machines deserving, at present, the name of "commercial", as they actually bring profits to their builders, as well as to their users

Standard Construction

Built around a 90 hp motor, they are capable of making speeds of 80 to 90 m p h, while carrying two passenger besides the pilot, and have a cruising range of some 300 miles. The design is very conservative, and almost always represents the plain single bay biplane with equal wings and very little stagger. The improvement in performances as well as adaptability to production is obtained by attention to details and by suppressing the number of parts, rather than by startling innovations Welded steel tube fuselages, and streamline steel tubes in land gears and interplane struts were conspicuous, as well as the use of central cabann and absence of conventional "center section" with all its wires and fittings Simple rectangular radiators of moderate size fitted either on upper wing, or under the fuselage, thus allowing easier access to, and removal of the engine, is characteristic of this class. The front cockpit is frequently made roomy to accommodate either two passengers, or a photographic camera, or any other possible load Still, the Curtiss OX5 engine is used universally on account of its suitable size, low cost and reliability It is difficult to predict what engines will be used when old OX5's become extinct, but one is inclined to believe that some of the air cooled engines of similar size, now being developed by several concerns, will be available by that time and will be used

200 hp Class

The second class of commercial airplanes has just made its appearance, and must still be considered to be in its infancy. It is to fill the demand for the airplane to be used on feeder air mail lines, and for passenger and freight transportation over the routes where the traffic is moderate and uneconomical in the use of larger machines.

Three airplanes representing this class were at Mitchel Field namely, the Wright-Bellanca, Fokker "Universal", and Sikorsky S3I, all powered with 200 hp Wright Whirlwind engines, and capable of carrying the normal pay load of 800 lb besides the pilot and fuel for a cruise of some 500 miles.

The Wright-Bellanca monoplane showed bewitchingly high performance, winning as it did, first prize in the efficiency test and second in speed race for commercial airplanes, with an average speed of 121 8 m p h over the triangular course. Indeed, this machine has higher speed than that of the DH4 used at present by the Air Mail, and it carries about twice the pay load, with only half the horsepower The aerodynamic cleanness of this machine is very excellent. The engine cowling with no apparent means of removal, excellent concealment of the control wires, and the location of the pilot in the enclosed cabin, must be tested yet in actual service, but the passengers' accommodation in this plane is by far the best of three, yet six people and some 3 hours flying, it may prove to be uncomfortably small

The Fokker "Universal" seems to be very practicable from the maintenance point of view, as it has everything well exposed with no cowles of any kind, and with excellent visibility from the pilot's seat. Unfortunately, it can hardly be considered as a passenger carrying machine on account of the rather uncomfortable cabin, which appears to be somewhat obstructed by fuselage bracing tubes This, however, does not affect its usefulness as a freight and mail carrier This machine did not take part in the races, and the manufacturer's word has to be accepted for its performance The high speed is claimed to be 110 m p h, which is lower than the speed shown by the Wright-Bellanca in the races.

The Sikorsky S3I, like the Fokker, looks very practical from the service point of view. Unlike two previous machines, it is designed primarily for freight carrying, and has a large freight compartment between two open cockpits The rear cockpit is occupied by the pilot, while the front one is available for passengers. This may prove to be a very convenient arrangement for the air lines ordinarily carrying the mail or express matter, with occasional demand for passenger transportation The freight compartment has windows on both sides of the fuselage, and can be used for two additional passengers if necessary In the race, over a triangular course, the machine showed a speed of 99 8 m p h

In conclusion, it must be said that this class of commercial airplane has hardly attained, as yet, the combination of performance and practical utility needed for commercial work, although it certainly shows good promise of success in further development It will be remembered that the single engined Junkers and Dornier "Comet" planes used on German air lines are essentially of this type, as also is the Spad used on some of the French air lines Although these machines have been replaced by larger and multi-engined machines on the more active routes, they nevertheless retain their value for freight carrying on less active routes

The Large Transport Planes

The third class includes passenger and freight carrying machines of 400 to 600 hp, capable of carrying a pay load of 2000 lb, in addition to a crew of two and fuel for a 500 to 600 mile cruise. The maximum speed of these machines ranges from 110 to 120 m p h. This class, although it did not take active part in the races, was represented by the Stout all-metal monoplane, the Fokker VII with Liberty motor, and the Fokker VII with three Wright "Whirlwind" engines It has been said that Stout is also going to fit his monoplane with three Wright Whirlwind engines, in place of the single Liberty.

It is difficult to determine the trend of the design with only two designers to consider. As it is the two Liberty engined machines are much alike as far as outside shape and arrangement of cabins go In each case 8 people can be seated in the cabin, and have about 45 cu ft. of air a piece In each, the pilot's cockpit is located under the leading edge of the wing, and seats two people. Structurally, Stout is an all-metal machine, while Fokker has the characteristic welded steel tube fuselage, and wooden veneered wing

The practicability of this class of commercial airplane is well demonstrated in this country by the several months of operation of the Ford express service, while bringing out the airplane of this class with three smaller engines in place of the one big one, will undoubtedly make it still more practical, eliminating, as it does, all probability of forced landings In this connection it is interesting to recall that the three-engined Junkers airplanes, which at present, are re-

(*Continued on page* 593)

Aftermaths of the New York Air Races

Indications of the Past Year's Progress Apparent at Mitchel Field

AVIATION interests in this country are so scattered that it is difficult to get a comprehensive picture of the entire field. Looking back at the New York Air Races, it is possible to indicate the tendencies and lines along which aviation has developed during the past year, and the probable future development during the coming year, but before trying to picture what the air gathering at Mitchel Field meant, it will be helpful to give a description of the conditions under which the meet was held.

Conditions of Race

For the first time the civilian planes were allowed to park in a field not under military supervision. Thanks to the courtesy of the Curtiss Company, the civilian planes were outside military control, and visitors had free access to inspect such planes as they were interested in. In theory, this sounds excellent, but the Curtiss Field is so far from Mitchel Field, where the air races were held, that most of the public did not know that there was a large number of commercial planes to be seen, and even if they had known, they were so scattered that they could not have seen them without much walking.

Also, many of the most interesting civilian planes were entered in the race events, and were forced to spend the day at the military field in a position where they could not be viewed by the public and where only a few fortunate ones with arm-bands could inspect them, except early in the morning or late at night. The weather, too, was against any loitering along the field. On the whole the public must have seen little of the development of the civilian aircraft.

Some of the planes at Curtiss Field were in the hangars, and some were parked on the field. There was no attempt at any orderly exposition, and, unless the spectator knew something about aviation, he learned little of their use or of recent development.

Another thing which must have confused the lay spectator was the fact that special planes with reduced wing area and high powered motors were entered in the same events with stock models, which are being produced in quantity. The production of commercial airplanes of the same model in considerable numbers is rather a new development, and those who manage air races should try to formulate some rule which would put stock models in one class and special racers in another. It would appear that this year's committee had not used sufficient initiative in meeting the changed conditions, and it is suggested that some new rules and contests be formulated for next year.

From the point of view of technical management, the races were excellently handled; the planes started on time, and the timing was excellently recorded. Most of the entries had been in the preceding years' meets, and knew the rules, so that the events went off very smoothly, but there is danger of the meets becoming too formalized if handled entirely by professionals.

Civilian Developments

Considering the tendencies among the civilian entries, three important new developments had a continuation of a development which was already in evidence at St. Louis and was even more pronounced at Dayton, was noticed. This latter development is the replacement of the war service training plane by a three seater plane built of new material and of excellent performance. This was illustrated by the small number of Jennies and Standards at the meet, and the large number of new planes which are now being built in quantity production along standardized lines.

The most important of the new developments is the appearance of a plane of about 200 hp, to be used for feeder air mail lines. It is true that such planes have been built before, but previously there has been no demand. This year it is obvious that the planes have been built because a demand actually exists. There were three of these planes in evidence, the Wright Bellanca, the Sikorsky and the Fokker. All three of these were fitted with the 200 hp., air cooled Wright Whirlwind engines. The Wright Bellanca and the Fokker are closed-cabin designs which could be used for passenger transportation as well as for mail. The Sikorsky plane is an open-cabined machine and not so suited for passenger work. The Sikorsky and the Wright-Bellanca were both entered in the races, and their performances can, therefore be accurately judged. Even when heavily loaded, the planes took off and climbed with great ease. The Fokker was not entered in any of the events, so the manufacturers' statements have to be taken as to its performances.

Commercial Engines

The second development of importance was the appearance in the exhibition hangar of two engines designed especially for commercial use. These were the Rickenbacker five cylinder radial engine of 80 hp., and the Fairchild Cammez four cylinder cam drive engine of 150 hp.

Reports also were circulated of three other engines which were being developed for purely commercial work. This is a most interesting and significant development as there is a decided limitation to the possible growth of aviation so long as it uses war surplus motors or engines designed primarily for military purposes. No fixed prices were put on either of the engines exhibited, but it was understood that they would be much more reasonable than the motors designed for military use.

The Curtiss Oriole which piloted by "Casey" Jones (standing by the wing), won both the Merchants Association of New York Trophy and the speed section of the Aviation Town and Country Club of Detroit race at Mitchel Field.

The Multi-Engined Plane

The appearance in this country of a three-engined airplane which has an excellent performance is an event of great importance. In Europe there have been several successful multi-engined airplanes produced, but it is only during the past year that there has been a decided tendency to use these on commercial airlines. It is hoped that the appearance of the three-engined Fokker in America forecasts a tendency toward the use of this type of plane on our airlines.

Mail Planes Absent

There is one most important development of American aeronautics during the past year, which was entirely absent at the New York Air Races. Reference is made to planes which the Post Office Department has on test at Maywood. There were eight of these new planes submitted for test and they probably represent the most interesting and significant effort of the aircraft industry during the year. The Air Mail is fully justified in concentrating its efforts on the work on hand but all those present at the races regretted that this splendid organization was not represented. The Air Mail, however, has adhered to the policy of flying the mail and not participating in shows of any kind.

The Light Planes

The public was pleased and interested in the light planes, but those who had seen them at the Dayton races were rather disappointed. Three of the Dayton planes, the Johnsen, the Munnert and the Dormoy, were at New York. They all had last year's engines but these had been adjusted to give greater reliability. The Moorehouse engine was not represented but there are reports of a most hopeful development with this power plant. The only new plane which flew, was the Powell, fitted with a Bristol "Cherub" engine, and it certainly gave a splendid demonstration of both power and speed. On the whole, however, it could not be said that light plane development showed any signs of expansion or of taking a firm hold. With the exception of the Heath, which did not fly, and the Powell, which was designed a year and a half ago, there were no new designs. None of the builders of last year's planes had faith enough in the future of light planes to build more planes of a similar type and no one with real financial backing has specialized in this field.

Military Aspects

The New York Air Races this year should be of considerable interest to the public, as it disclosed some of the new equipment which will, it is hoped, some day, replace the old war surplus material now in use. Last year, at Dayton, only the faithful old DH performed in the observation race while Martin bombers monopolized the bombing race. This year there were three new types in the observation plane race and four new types in the bombing race. Although most of these planes have been in operation for over a year, they can only be considered as samples, as none of them have been put into production on a large scale. The real backbone of our air force, the DHs, the Martin bombers and the Jennies, were herded so far away from the visitors enclosures that they could hardly be seen and very few took the long walk, which was necessary to look them over.

There are many who claim that the United States is behind in production but ahead in engineering. The fact that a French Breguet day-bomber was faster than any of our observation planes made some believe that American observation planes were not as good as they were thought to be. It is true that the winning Breguet had the most powerful engine in the race but the other Breguet had the lowest powered engine entered and was less than one mile an hour slower than the fastest Air Service plane.

The bombing race was more impressive. The Martin SC6 the Douglas Transport, the Huff-Daland and the Douglas Bombers, are all decided improvements over the antiquated two engined Martin bombers. Some of these machines have been built in considerable numbers and have proved that they are serviceable. The Navy and Marine Corps entries in this event added to the competitive interest.

As a demonstration to the general public of the existence and purpose of an American air force, the meet failed completely. There were four long rows of military planes of mixed designs it is true, but representative. Had all these planes taken to the air and flown by at one time, in squadrons and in formation, the spectacle would have been most impressive. By using Curtiss, Roosevelt and Mitchel Fields, this could easily have been done, and would certainly have been a great advertisement for the air force which is, after all, primarily the purpose of the meet.

There was some beautiful stunt flying by Lieutenant Barksdale and Lieutenant Doolittle, and a good exhibition of pursuit plane formation stunting, but there were several displays which the army could easily have made but which were entirely missing. One was the laying down of a smoke screen, which is always of interest to the public. There were also no bombing events of any kind, and, after all, if a large meet is held at great expense to demonstrate what air power can do, it would seem as though such events should be on the program.

Summing up the impressions of the annual races, it can be stated that the meet lacked coherency and novelty. It followed the program of previous years with monotonous regularity. Imagination or any perceptible show instinct were lacking. It is for this reason perhaps that the crowds were absent on the days when weather was not a deterring factor.

Royal Air Force Flight from Egypt to Nigeria

It is announced that three service airplanes from No. 47 Squadron of the Royal Air Force, stationed at Helwan, will leave for a flight from Cairo to Kano in Nigeria during the coming autumn.

The flight is being undertaken for the purpose of gaining experience in long distance flights over tropical countries where few facilities in the way of the ground organization required by aircraft exist.

The route to be followed will pass through the Sudan, French Equatorial Africa and past Lake Chad to Kano, the capital of Nigeria. The places to be visited for refueling etc., will be, Aswan in Egypt, Khartoum, El Obeid, and El Fasher in the Sudan, Abecher and Fort Lamy in French Equatorial Africa, Maiduguri and Kano in Nigeria.

The organization of the flight is being undertaken by Air Vice Marshal Sir Oliver Swann, K.C.B., C.B.E., the Air Officer Commanding, Middle East. Squadron Leader A. Cunnghem, D.S.O., M.C., D.F.C., will be in command of the flight, which will start about the end of October.

Technical Aspects of the Air Meet

(*Continued from page 591*)

placing smaller Junkers machines on the most important routes in Germany, belong also to this class.

The following table gives a summary of the requirements for the machines of each class as observed in the planes assembled here in connection with the races:

Class	I	II	III
Pay load in pounds	300-400	800	2000
Speed—maximum in miles per hour	80	100-120	110-120
Cruising range in miles	300	500	500-800
Horsepower	80-100	200	400-600

In describing the outstanding classes of commercial airplanes, no claim is made to have covered all airplanes present at the air meet, but only those that show the tendency of differentiation. There exists a considerable number of airplanes falling somewhere between the first and second classes, particularly those built around Curtiss C6 and Hall Scott engines. It is believed, however, that once differentiation into classes becomes noticable, it will become more and more sharply defined as time goes on. The distinct classes of commercial airplanes exist in response to the actual demand, and the designer bringing out an airplane of "between-the-class" type, will have much difficulty in finding the use for it, particularly in respect to engines.

Some Light Planes at the Air Races

Three Interesting Light Plane Designs

The DJI is a Henderson-engined plane, designed by Mr. Ivan T. Driggs, which won the speed race in the 80 cubic inch class at Dayton last year. This little airplane was the first evidence of aerodynamic advancement in the small-powered units since the war. Its clean lines, refinement of design, high aspect ratio, low parasite, and excellent engineering were heralded last year as the latest word in low powered flying. It is to be flown this year again, following a crash this summer, having been rebuilt, along practically the same lines as last year. It is interesting to note that this was the only light plane in America that was developed through wind tunnel experimentation. The tests were conducted in Mr. Orville Wright's wind tunnel laboratory at Dayton. It was there that the enclosed cabin, the cowling arrangement, and the triangular fuselage form were developed. Previous to these tests, of course, accurate determination of the induced drag was made in the process of design. It was easy to see that the little plane would perform well if the engine did not fail and its success was in no way surprising.

The second light plane is none other than Mr. Etienne Dormoy's "Bathtub" of Dayton fame. But now it has been revamped so that its bathtub characteristics are scarcely perceptible. The aerodynamic improvement is easily to be seen in the new lines of the fuselage, and the performance will undoubtedly show an equal increase. The Henderson

The New Dormoy Light Plane

engine has also been the object of a great deal of engineering skill during the past year. New bearings have been installed, every part has been inspected, balanced, or considered from the point of view of improved reliability. It will develop five to eight horsepower more than it did last year. The fuselage parasite has been decreased fully twenty percent, and the weight is practically the same. This has meant a considerable speed increase.

The third light plane is the most interesting of them all for several reasons. While it is not as "clean" in design as the first, and while it has not the interest of the second from last year's popularity, it is preeminent from some other points of view. This is the Roché—Dohse light plane with the new Morehouse M 80 engine. This engine was described in some detail in AVIATION some months ago. It is the first real American aeronautical engine in the light plane class. Its entry into the air will be heralded with much enthusiasm, for it has now shown its reliability, its power, and its air-worthiness. It is a justification of the two-cylinder opposed type as applied to small aircraft engines. The front view shows its installation in the nose of the fuselage. It is not cowled in at all, as it might be for reduction of parasite, but it is decidedly good-looking with ruggedness combined with neatness of design. It develops something over 29 hp. at 2800 r.p.m., and it pulls this little plane along surprisingly well.

The airplane is a design of Mr. Roché of the Engineering Division of the Army Air Service. It was built for "personal flying" and, we suspect, largely as inexpensive means of air-testing the M-80, which purpose it has served very well. It is a well-built job with a welded steel tube fuselage and a two spar monoplane wing, externally braced. Its aerodynamics is not to be scoffed at in spite of the fact that aerodynamic efficiency was not the chief object sought in the design. The large span, the elliptical wing-tips and the quite apparent

The Roche Dohse Light Plane

structural lightness (it weighs 339 pounds with gas and oil but minus the pilot), are noteworthy. The likewise streamlined flying wires and streamlined tubes on the cabane, the high aspect ratio ailerons, the long fuselage, the large tail surfaces, all making for easy control, the enclosed landing gear with only the 20"×2" wheels outside the fuselage. While there is little new in the design of this light plane, and its designer had in mind chiefly inexpensive construction and ease of flying, nevertheless, the marks of a master hand are visible.

Mr. Dohse has flown this little plane twenty-five times this month. It got off the ground in six seconds from a standing start, and it climbed to 6,000 feet in ten minutes with a 170 pound pilot. One feature of special interest in connection with the tests is the fact that Mr. Dohse, the builder and pilot, made his initial solo flight in his new plane, this flight being also the first solo of the plane and the first time the engine has been in the air. Whether the success is due more to the remarkable ability of the pilot, the ease of handling the light plane in the air, or the perfect performance of the engine, it is impossible to say.

Unfortunately the Roché Dohse light plane was prevented from figuring in the two light plane events of the National Air Races and consequently the performance of this interesting design with the Morehouse engine was not matched against the other entries.

Showing the Morehouse Engine in the Roche-Dohse

New World Records

September, 1925.

CLASS C (Airplanes)

With useful load of 1500 Kgs. (3306.93 lb.)

Duration (Holland) B. Grase, Fokker F7, Liberty 400 hp. At Schipol, July 27, 1925. 3 hr. 3 min. 30 sec.

Former Duration Record (United States) Lt. J. A. Macready, U.S.A.S., Curtiss (Martin) Bomber, NBS1, 2 Liberty 400 hp., at Wilbur Wright Field, Dayton, Ohio, Oct. 2, 1924. 2 hr. 13 mm. 49.6 sec.

AIRPORTS AND AIRWAYS

Detroit News

By Virgil Simmons

Now that the first airplane reliability tour, held Sept. 28 to Oct. 4, beginning and ending at the Ford Airport for the Edsel Ford Trophy, has taken its place as the greatest single boost American commercial aviation has yet received, the outstanding fact remains that airplanes, both large and small, are now in production that can be depended upon to go from one place to another with speed and safety, and even through the most adverse weather conditions.

Great credit is due to the fine technique of the pilots, as well as the excellent workmanship and efficient design of the contestants. One realized this very forcefully on the last lap of the tour, from Cleveland to Detroit, when the sky was "right down on the ground."

Two interesting phases of commercial aviation have been worked out at Eastwood Flying Field, which is in charge of the writer, real estate sales by air and the treatment of semi-deaf and blind patients. Both have proven successful, definite improvement has been secured in Frank Mayers case of deafness. The method is the rapid change of pressure, coupled with vigorous swallowing at proper intervals.

Mr. Ritch, the well-known superintendent for Dreman and Seldon, has used both the Travel Air and the Hispano Laird, piloted by the writer, for actual real estate sales, it is gratifying to know such satisfactory results can be gained through the use of modern aircraft equipment.

Kalamazoo, Mich.

The Kalamazoo Airport Association, a newly organized non-profit corporation formed for the promotion and advancement of aeronautics in the middle west, will stage an extensive air meet and exhibit at its flying field at Kalamazoo, Mich., on October 24 and 25. The Association offers a cordial invitation to all fliers and manufacturers to attend the meet and display their planes. The Association announces that hotel accommodation will be provided to flier and crews and all fuel and oil together with transportation facilities will be arranged for.

Among the fliers who will participate in the meet are a number of army fliers as well as many notable civilian pilots. The Association, formed only a month ago, has been enrolling new members in large numbers every day. The substantial business men of the community, stirred by constant pounding in the local press, have fully awakened to the fact that aviation and the tremendous possibilities it opens up commercially have arrived. They are taking hold of the flying business and have already provided a field which is declared by experts to be one of the finest and best natural flying fields in the country.

An Advertising Correction

Through a typographic error made by the advertiser, a special sale of new Standard J1 airplanes at a very low price by the Nicholas-Beazley Airplane Co., of Marshall, Mo., advertised in the Sept. 21 and 28 issues of AVIATION, was extended to Nov. 1, 1926. The actual closing date of the sale should have been Nov. 1, 1925, and the advertiser offered to accept immediate orders for the planes and to make delivery at any time up to May 1, 1926 without storage charges. A corrected advertisement appeared in the Oct. 19 issue of AVIATION.

Robertson Gets Chicago-St. Lewis Mail Contract

The Robertson Aircraft Corp. which was incorporated in 1921 is well known throughout the United States as one of the largest dealers in aircraft and aircraft supplies. Their main base is near the Saint Louis Flying Field at Anglum, Mo., but they have supply depots and warehouses at San Antonio and Houston, Texas, and at New Orleans, La. They also have supply stations at Kansas City, Mo., Ft. Wayne, Ind., and St. Louis, Mo. They have acquired the whole stock of surplus Standard J1 planes which they practically rebuild before selling, thereby obtaining a very reliable plane. In spite of fires which cost the company $75,000 during the last two years the surplus account has been increased to approximately $250,000 during the four and a half years of its operation.

The company has available for the air mail service four new Curtiss Oriole planes, two with brand new K6 motors and two with 180 hp. Hispano-Suiza engine. They also have one DH plane with Liberty motor in operation and have four more under construction which will be ready for use shortly.

Mr. Wm. B. Robertson, President of the corporation, learnt to fly in the army during 1918, he had a total flying time of approximately 2,500 hours. Mr. Frank H. Robertson, Vice President of the organization also learnt to fly in the army and has had in the neighborhood of 2,000 hours. The pilots who will fly the mail are Charles Lindenbergh, Clyde Clevenger, Smith and Nimick.

The expansion of the Robertson Aircraft Corp. from the field in which they have been so successful into a new field will be watched with interest by their many friends.

Muncie, Indiana

The Muncie Airport was officially dedicated in Sept. a large number of army and navy planes being present for the occasion.

The field contains 120 acres and is situated in the South East section of the city. All the things necessary for the visiting pilot are available at the field, there is a hangar and a good stock of supplies and spare parts. E. E. Basham, the chief pilot for the Muncie Aerial Co. extends a most cordial welcome to all visiting pilots.

The opening feature of the dedication program was an exhibition of formation flying by visiting army fliers. This was followed by various exhibitions of individual stunt flying. There followed a talk by the Rev. Mr. Emerson. Throughout the address he stressed the fact that all citizens of Muncie should be boosters, not only for the Muncie Aerial Co. but for everything in general.

Air Routes to South America

During the course of his testimony before the special board appointed by President Coolidge to make a study of the best means of developing and applying aircraft in national defense, Postmaster General New disclosed the fact that more than a year ago he had sent a couple of post office inspectors, in cooperation with representatives of the Army Air Service to make a survey with a view to establishing an air mail route connecting the United States with Central and South America. The information was given the Committee members by the Postmaster General after Senator Bingham, of Rhode Island had questioned him with regard to the possibilities of promoting our trade with South America by giving us more rapid transportation of mails through such routes from New York to Key West and thence across to Cuba and thence down the shores of Central America to Panama.

"These gentlemen," replied the Postmaster General, "went down through that section, reached a conclusion for themselves that there was not enough business to justify the inauguration of such a line and came back and so reported."

The Postmaster General went on to state that some months ago, Dr. von Bauer called on him with reference to the company that is now flying and has been for some time flying up the Magdalene River from Barranquilla to Bogota, Columbia.

"Dr. von Bauer came to me," he said, "and spoke of their desire to inaugurate a mail service between Columbia and the United States. He wanted to fly from Barranquille up to the mouth of the Panama Canal, the Pacific end of the canal, and thence up the West Coast to some place in Guatemala, touching at two or three coast points there, and at Limon, Nicaragua and then crossing Guatemala into the Gulf of Mexico, and flying across the gulf to Havana, and thence to Key West.

"He wanted to know if the Post Office Department would guarantee any mail to the company undertaking that work. I informed him that inasmuch as his concern was a foreign company the Post Office Department could not do so. I also told him that I was certain that neither the State Department nor the War Department would give any authority to any foreign-owned or foreign-operated company to land airships at the mouth of the Panama Canal and I certainly would not be willing to enter into any such engagement."

The Postmaster General said he informed Dr. von Bauer if he would come to the United States and organize a company backed by American capital, with ships flown by American pilots he would give him mail and would be glad to see the venture inaugurated.

Then Dr. von Bauer, according to the Postmaster General, went to see officials of the State and War Departments, as well as Secretary of Commerce Hoover.

"I am sure what I said to him," said Mr. New, "was amply confirmed by all of these officials."

Dr. von Bauer came to see the Postmaster General later on and stated that he had been in New York and had succeeded in interesting American capital and that he either had or was about to incorporate an American company and that a company was incorporated under the laws of the state of Delaware. "Then, still later," continued the Postmaster General, "the Columbian government asked our government for permission for this company to fly one trial trip to see if its plan was feasible. That was considered by the State Department and by the military authorities, and while I had nothing to do with it I know the permission was granted and the company did fly that trial trip. I do not think they had yet got to Key West and the last I heard of them they were some place on the Gulf of Mexico, headed for Havana. I do not think they have gotten there yet.

"It has been commented on by the newspapers and the Postmaster General has been criticized for not having undertaken to fly an air mail line to South America. It may be just as well to have stated here what the Postmaster General has really done to see whether it was worth while or not. And that was more than a year ago."

Autogyro Tested in England

A British pilot flying the La Cierva Autogyro on Oct. 12 at the British experimental station at Farnborough reached an altitude of 1,000 ft. The Autogyro was invented by Senor Juan de la Cierva, a Spaniard, and was described in the April 9, 1923, issue of AVIATION. Since that time the machine has been flown repeatedly and has undergone tests in France as well as in Spain. The principle of the machine remains the same but refinements of design have brought about a considerable betterment of performance. The machine started climbing when the revolving wings were turning at 120 revolutions per minute and the machine rose almost vertically. The landing was made apparently under perfect control and with a forward speed of only 20 m.p.h.

To Build Amundsen Hangar

Forty men, chiefly carpenters and masons with a few electricians, left Oslo on Oct. 13 for Kings Bay, Spitsbergen to build a hangar for Amundsen's airship.

Lincoln Ellsworth, the American, has given $100,000 for part of expenses of the expedition which will be known officially as the Amundsen-Ellsworth Expedition.

It will fly the Norwegian flag only.

Zeppelin Plant to Make Buckets

Pessimistic as to the outcome of his attempt to raise funds by popular subscription for the building of a mammoth Zeppelin for polar explorations, Capt Hugh Eckener told a Hamburg audience that he proposes converting his Friedrichshafen works into a plant for the manufacture of milk buckets, cooking utensils and hot water bottles. His idea in using this Zeppelin plant for other purposes is to hold his trained workmen together until the ban on Germany's building of modern Zeppelins is raised when the plant can be converted to its original uses.

He pointed out that the Shenandoah cost as many dollars as did the Los Angeles marks, but stressed that while Germany wanted no monopoly she could produce the best ships at lowest cost owing to her experience and training. Eckener believes the ideal way to keep his staff together and encourage development and progress would be to construct his proposed exploration ship

Weather Warning System Plan

Dr W R Craig of the weather bureau stated before the naval court inquiring into the Shenandoah disaster that an elaborate system for warning aircraft of the development, character and movement of dangerous air disturbances along the principal airways of the country has been prepared by the United States Weather Bureau

The plan contemplates establishment of principal stations at 250 mi intervals along the airways, supplemented by a large number of secondary stations to report on local thunder squalls and other disturbances.

The plan has been submitted to the Civil Aviation Committee created under the department of commerce and the bureau is hopeful that it would be put in effect.

Airplanes Aid Investigations of Wheat Rust

The Air Service Technical School at Chanute Field, Rantoul, Ill, recently aided the U S Department of Agriculture in a scientific investigation for the purpose of gathering information on the origin and spread of epidemics of the black rust disease of wheat, oats, barley and rye. The Technical School was represented by Lieut. John V. Hart, who piloted a DeHaviland airplane, and enabled Gordon C Curran, of the U S Department of Agriculture, to make observations at several points in the United States to determine how prevalent spores of this disease are in the upper air.

They left Chanute Field for a flight over Iowa and the Dakotas to the Canadian line, thence across Minnesota to Fort Snelling near Minneapolis, from there over Wisconsin, Lake Michigan and Michigan to Selfridge Field, Mt. Clemens, Mich., returning from there direct to Chanute Field.

The trip required a week's time, during the course of which 2,630 mi were covered. More than 100 glass slides were exposed to the upper air currents and excellent rust spore material was collected for study in the experimental laboratories of the Department of Agriculture

The airplane is a great aid in studying the distribution of spores of pathogene fungi. It is likely to be very useful in epidemiology studies and it also may be useful in determining the value of establishing quarantine lines.

Chicago News

The Yackey company reports that the performance of their Sport model in the Ford Rehobilty Tour has greatly stimulated the demand for the plane and that as a result they are booked up far ahead on orders. They have also added some more ground to their field and all fliers are cordially invited to take advantage of their repair facilities, their gas and oil accommodations and hangar space.

United States Air Forces

U. S. ARMY AIR SERVICE

Air Service Maneuvers

The concentration of military airplanes during the Pulitzer races at Mitchel Field was followed by concentration and maneuvers at Langley Field. The air force consisted of the Bombardment Group from Langley Field, the Attack Group from Kelly Field, Tex. and the Pursuit Group from Selfridge Field, Mich. The maneuvers were held against targets representing landing parties of a hostile nation.

These demonstrations included the bombing of these targets and attack by machine guns. The maneuvers culminated with a special demonstration at Aberdeen on Saturday Oct. 17 at 2:00 o'clock. The objects of the maneuvers were:

To train Air Service officers to act as staff officers in an air force command;

To train the different elements of an air force, such as pursuit, attack and bombardment, to cooperate one with the other, and

To teach one branch of aviation the tactics used by another, so that they can properly coordinate their activities in the air and protect one another.

Army Air Orders

Sec. Lt. Harvey Morton Cronk, A S. Res., New York City, to active duty, McCook Field, reverting to inactive Status Nov. 1.

Appointment and assignment of following Sec. Lieuts. in Reg. Army from enlisted men, Reg. Army, and from civil life, announced:

Master Sergeant Walter Llewellyn Wheeler, Air Service, Hawaiian Department, assigned to Air Service, Hawaiian Department.

Staff Sergeant Norme D. Frost, 8th Attack Squadron, Kelly Field, Texas, assigned to Brooks Field, Texas.

Technical Sergeant Linur Dodge Frederick, 44th Observation Squadron, Fort Sill, Oklahoma, assigned to Brooks Field, Texas.

Flying Cadet Willard Lynn Harris, cadet detachment, Scott Field, Illinois, assigned to Langley Field, Virginia, upon completion of course at Scott Field.

Staff Sergeant Milton Miles Murphy, 8th Attack Squadron, Kelly Field, Texas, assigned to Brooks Field, Texas.

Staff Sergeant Lee Quintus Wasser, 27th Pursuit Squadron, Selfridge Field, Michigan, assigned to Kelly Field, Texas.

Technical Sergeant George Charles McGinley, 47th School Squadron, Brooks Field, Texas, assigned to Kelly Field, Texas.

Flying Cadet Otto Wienecke, cadet detachment, Brooks Field, Texas, assigned to Kelly Field.

Master Sergeant Benjamin Thomas Starkey, 8th Airship Company, Scott Field, Illinois, assigned to Phillips Field, Maryland.

Transfer of First Lieut. Charles Backes, Inf., to A.S., with rank, announced.

First Lt. Ward F. Robinson, A S., Maxwell Field, to Pope Field.

Aaron Jackson Yauger, assigned to Air Service Primary Flying School, Brooks Field, Texas.

Charles Howard Valentine, assigned to Air Service Primary Flying School, Brooks Field, Texas.

Joseph Kerr Gibson, assigned to Air Service Primary Flying School, Brooks Field, Texas.

Used Liberty Engines for Sale

The Material Disposal Branch of the Air Service is asking for bids to be opened on Nov. 20 for the purchase of used Liberty engines. The motors have been adjudged unsuitable for flying and they are sold with the restriction that they will not hereafter be used for flying, the words "not to be flown" being stamped on the crankcase. The engines are, however, repairable and by overhauling can be rendered serviceable for use in boats and for other non-flying purposes.

U. S. NAVAL AVIATION

Denies Dirigible Corrodes

A report that the gas cells of the airship Los Angeles were rotting and the metal frame corroding was denied by Comdr. Jacob H. Klein executive officer of the Naval Air Station.

Commander Klein explained that the Los Angeles was getting a thorough overhauling and that no repairs other than those incidental to normal wear and tear had been found necessary.

"Ships of this type," he said, "should be overhauled every 5,000 miles. The Los Angeles made a trip here from Germany, two round trips to Bermuda and one round trip to Porto Rico.

"During all that time she never got an overhauling. Upon her return from Cleveland last July the engines were removed from the ship and sent to Philadelphia. Several of the gas bags were sent there, too. In putting these bags in the ship and taking them out they are frequently torn and it becomes necessary to patch them. The Los Angeles cells are in no way inferior to those of any other ship."

Commander Klein said stories of corrosion also were false. Duraluminum, of which the Los Angeles is made, he explained, was subject to corrosion like other metals. But a constant inspection was made and wherever corrosion was observed the affected parts were replaced.

The Los Angeles is expected to be ready for flight about Dec. 1.

Navy Air Orders

Lt. (jg) John G. Jones det. Nav. A. Sta., Pensacola, to Aircraft Sqdns., Battle Flt.

Lt. Lisle J. Maxson det. Nav. A. Sta., Pensacola, to Nav. Aircraft Fact., Phila.

Lt. Roland G. Mayer det. U.S.S. Shenandoah to Nav. A. Sta., Lakehurst.

Lt. Comdr. Charles E. Rosendahl det. U.S.S. Shenandoah to Nav. A. Sta., Lakehurst.

Lt. John H. Campman det. Nav. A. Sta., San Diego, to Nav. Av. Res. Unit, Sand Point, Wash.

Lt. Frederick Meyer det. Com. Nav. A. Sta., Cape May, to continue treatment Na. Hops., Phila.

Lt. (jg) Charles E. Bauch det. U.S.S. Shenandoah, to Nav. Air Sta., Lakehurst.

Ch. Gun. Alvin E. Skinner det. U.S.S. Colorado to Nav. Acad.

Ch. Gun. Raymond Cole det. U.S.S. Shenandoah to Nav. A. Sta., Lakehurst.

Ch. Mach. Shine S. Hallihurton det. U.S.S. Shenandoah, to Nav. Air Sta., Lakehurst, and temp. Nav. Airef. Fact., Phila.

Lt. Mathias A. Thormahlan det. U.S.S. Brazos to com. Nav. A. Sta., Cape May.

Lt. John H. Galhon det. U.S.S. West Virginia to Nav. A. A. Sta., Pansacola.

Lt. Roland G. Mayer det. U. S. S. Shenandoah to Nav. A. Sta., Pensacola.

Marine Corps Orders

Maj. H. C. Pierce and Sec. Lts. J. G. Walraven, W. J. Scheyer, M. B. Twining, F. E. Sessions det. Nav. A. Sta., Pensacola, to MB Quantico.

First Lt. H. R. Anderson det. MB, Quantico, to Chemical Warfare Sch., Edgewood, Md.

PUBLISHER'S NEWS LETTER

Aviation events of such great importance have been taking place in such close succession that a most significant development abroad has been overlooked by nearly everyone who is following aerial progress. A cable dispatch from England made the casual announcement that the British Air Ministry had ordered American aircraft engines for use in the Royal Air Force airplanes. If this news had been published at any other time it probably would have been considered worthy of national notice. The public has been so inundated by a flood of aeronautical sensations that the mere fact that American engines are to be used by the British has been lost sight of.

* * * *

To understand the full importance of this complimentary decision, it should be recalled that Mr. C. R. Fairey, the well known English constructor, last year secured the rights to build Curtiss planes and engines in England. At the same time he also made arrangements to manufacture the Reed propeller. When it became known in English aeronautical circles that an English constructor had decided to introduce American designs to compete with British products, there was great resentment in some quarters, particularly with the engine manufacturers. The success of the new American racing types of planes, engines and propellers caused the Air Ministry to inquire more closely into the causes of the great speed increases that were being made at each succeeding race.

* * * *

This situation has been rendered more acute by the recent decision of the Air Ministry to purchase engines made in the United States. The British engine manufacturers naturally felt that this is a violation of the very fundamental of a self-contained national defense. Even the fact that these engines are to be manufactured as soon as practicable in England has not seemed to allay the feeling of dissatisfaction over the direct foreign competition. At about the same time, the adoption of the American parachute by the Air Ministry gave further cause for dissention. All of which seems very much like chickens coming home to roost.

* * * *

If any country has had to bear its undue share of what might be termed foreign competition, it is the United States. Before the War, the Hispano-Suiza engine was brought over and manufactured in competition with American designs. Then came the English invasion of aircraft design. The DH and Handley-Page, not to mention the Bristol Fighter were adopted as standard types here. Since the War the dumping of surplus war airplanes and engines was prevented only by the high duties and the Wright patent protection. The Junkers and Fokker competition had also caused concern, but on the whole this has seemed to stimulate American designers to greater endeavor.

* * * *

It is difficult for those whose interests are directly affected, to find any comfort in the theory that every effort is stimulated by outside competitive pressure. In an art as international as aeronautics, there is bound to be a greater interchange of ideas, products and personnel than would be the case in most other developments. The shipping industry is a close parallel. This was built up by taking the best from all types until a standardized product became the rule. With the history of British export policy in mind, it is hard to feel that the introduction of a few American engines, that have created so many world records, will not go far toward the stimulation of the British engine industry and the ultimate effect will be beneficial.

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CONTINUED

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HISTORY OF AERONAUTICS

By E. C. VIVIAN

We have a few copies left of the above.

The retail price is $3.00, with the first ten new or renewal orders, $2.50 with subscription. This work is divided into four parts: The Evolution of The Aeroplane; Progress in Design; Aerostatics; Engine Development. There are 521 pages with numerous illustrations of photographs and diagrams.

Gardner Publishing Co., 225 Fourth Ave., New York, N. Y.

SPECIAL CLEARANCE SALE

We are clearing our shops and hangars of all ships and material so that we can make room for production of our YACKEY SPORT OX5 job, which made such a wonderful showing in the FORD RELIABILITY TOUR,

and for which there were so many orders OUR LOSS YOUR GAIN

GUARANTEED	MOTORS	AS REPRESENTED
2 Isotta Fraschini Motors, complete less magnetos, these motors were received by us from the Air mail and we understand they have never been flown, each for		$175.00
3 Renault 12a cyl. 300 HP with the following extras: 1 crankcase, 1 crankshaft, 1 set con. rods, 4 extra cyl. banks, 4 extra camshafts and a miscellaneous asst. of carburetors and manifolds, THE WHOLE LOT FOR		750.00
The following assortment of Hisso parts: 4 banks; 1 crankcase; 2 crankshafts; 18 con. rods, plain end, 13 forked con. rods; 1 lot of new rings, quantity of new camshaft bearings; 1 Zenith and 1 Schiebler carburetor; 1 wire loom; 1 hand crank starter for boat; 5 magnetos; 2 sets of intake manifolds 30 pistons, some new; 1 oil pump; 20 valves; 4 curved water pipes; 4 prop. hubs; 1 oil pump; 1 new camshaft for boat or racing auto; a lot of new main bearings; 10 new wrist pin bearings; and 7 new camshaft bearings. THE LOT FOR		450.00
1 OXX3 with double distrib. Berling Mag., valves ocod regrind $125.00 2 OX5 motors, ideal for school work, each		35.00
2 OXX3 motors, less magnetos and carburetors only, each $95.00 2 L6 motors, as received from the Government each		425.00

AIRPLANES GUARANTEED TO BE AS REPRESENTED, BARGAINS FOR

1	Standard with OX5, original covering, a bargain	$ 600.00	1	3 place OXX6 Canuck, excellent condition 950.00
1	OXX6 Canuck new linen covering, wonderful ship for	900.00	1	JN4D with OX5 motor, guaranteed, for 850.00
1	Renault Breguet, RE-NEW-ED, guaranteed same as new	4750.00	1	T.M. with new 80 LeRhone, had three hours 500.00
1	JN4D with Canuck lower wings, OX5 turns 1450, colored yellow			575.00
1	Standard with L6 motor, 3 place, new covering, guaranteed perf.			1850.00

WONDERFUL VALUES IN AIRPLANE PARTS COME AND GET THEM FOR ONLY

1	Factory rebuilt Canuck fuselage, with controls, gas tank, instrument board, tail surfaces and ailerons, ONLY	$250.00			
1	Factory rebuilt JN4D fuselage with controls	250.00	2	Jenoy stabilizers, uncovered	50.00
1	Jenny right lower wing, new, not covered	50.00	1	Jenny left lower wing with broken rake	30.00
1	Cooler section, emergency, Standard, leak	15.00	9	Sets D H. Wheels slightly rusty, per pair	7.50
6	Lower wings, T.M. each covered, each	25.00	8	Ailerons, T.M., covered, Tube control, each	5.00
8	Stabilizers, T.M. each	10.00		Navy Type distance thermometers each	7.50
	Brand New Duckey compasses, in original boxes, elec. comp. ea				7.50

Subject to prior sale and change in price without notice, all goods F.O.B. Forest Park, 50% with order, balance with bill of lading, C.O.D.

YACKEY AIRCRAFT CO. CHECKERBOARD FLYING FIELD, MAYWOOD, ILL.
(ADJACENT TO AIR MAIL FIELD)

"KEY" YOUR ADVERTISEMENTS

in

AVIATION

AND OTHER PUBLICATIONS

If you want the final word on Advertising Returns and Costs

This is the advice of one of the largest dealers in aircraft parts and supplies, who understands advertising and uses it consistently to expand his business. In a letter of September 28, to AVIATION, this advertiser (name upon request), after telling how, by the key system, he has proven the exceptional advantages of AVIATION advertising, continues as follows:

"Regardless of how much is spent with you or others, *the cost per inquiry is substantially lower in* AVIATION *than in any other paper*

"Every paper in the field claims to give the lowest cost per inquiry, which is only natural, but I KNOW, I have proven it over a long period."

Reduce Claims to Facts by "KEYING" YOUR ADS.

AVIATION

100% Coverage of the Flying Field

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CLASSIFIED ADVERTISING

10 Cents a word minimum charge $2.50 payable in advance. Address replies to box numbers, care AVIATION, 225 Fourth Ave., New York.

FOR SALE—AC Bar Type Spark Plugs, lots of 1000 12½c less 15c, Bethlehem Ponsot Spark Plugs, lots of 1000 7½c less 10c, various other makes of French Spark Plugs. Low Compression Liberty Pistons $2.50 each, Liberty Piston Rings 12½c each, Hisso Piston Rings 12½c each, Hall Scott Piston Rings 10c each. All prices are FOB Norfolk. Southland Jobbing House, Norfolk, Va.

Jenny special, all Canuck upper wings clipped, DH wheels, streamlined, steerable tail skid, 43 gas capacity, special valve action and prop., develops 115 hp., good performance with two passengers. Sacrifice at $600.00. Another Jenny as is, $250.00, spare OXX6 motor at $175.00. John Cline, Alix, Ark.

FOR SALE: Used Jennie with new motor $800. Used Jennie with good used motor $700. Good used OX5 motor complete, $100. Storms Aviation Co., 20 N. Spruce St., Asheville, N. C.

AIRPLANES FOR SALE. Brand new Canuck, original factory job, with fifty hours flying-time (OX5 motor), $900.00. Standard original factory job (OX5 motor), $800.00. Shannon & Wert Bros., Aviation Company, Parsons, Kansas.

FOR SALE. One brand new Curtiss Seagull with C6 or K6 motor, set up and ready to fly. Curtiss Metropolitan Airplane Co., Port Washington, Long Island.

WANTED: K-6 and C-6 motors and parts; price must be low. Robertson Aircraft Corporation, St. Louis Flying Field, Anglum, Mo.

FOR SALE. Canuck, Standard, Jennie in good condition, ready to fly. Priced reasonably for quick sale. Raymond Fisher, Des Moines, Iowa.

WANTED. 160 hp. Mercedes motor or other foreign motor of about same hp. Give lowest price and all particulars. Running condition not necessary, but must be complete. P. Schill, Milton, Vt.

FOR SALE. Brand new OX5 motor $225. Also some new OX5 parts. Write for list. Box 215, Macon, Missouri.

WANTED—Seagull or M. F. hulls. With or without surfaces. Also K-6 and C-6 Liberty 6 motors. State full particulars and condition in first letter. Harry Rogers, Curtiss Field, c/o A. C. McNamee, Garden City, L. I., N. Y.

FOR SALE: Twenty-four inch Navy searchlights, type H. C., fifty ampere, one hundred twenty-five volts, manufactured by the General Electric Company. Southland Jobbing House, Norfolk, Va.

New Hall-Scott Boeing seaplanes in original crates $1,000, set up as land jobs $1,000. One five-place semi-cabin 200 hp. Boeing Renault land job at $3,000, one at $2,500. New sets Boeing wings and tail surfaces in original crates $450. Boeing pontoons $50 per pair. Ontario Aircraft Corpn., Ontario, Calif.

WANTED. Wright E4, 200 hp. complete, rebuilt or new, give lowest cash price. Must be guaranteed. State history of motor and hours used. R. P. Applegate, Palm Beach, Fla.

LEARN AVIATION! Earn your way through Flying School. Send 25c for large illustrated catalog and details. Flying Mechanical Homestudy courses. Verney Aircraft Co., Peoria, Ill.

WANTED. Used airplanes in most any condition. Give price and condition in first letter. N. E. Storms, 20 N. Spruce St., Asheville, N. C.

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DESIGNERS AND MAKERS OF ALL TYPES OF AIRCRAFT

For British and Foreign Governments.

The "Gloster Grebe" Single Seater Fighter with Jaguar engine, forms a prominent part of the Royal Air Force equipment and embodies all the results of the extensive experimental work carried out by The Gloucestershire Aircraft Company in machines of high performance and efficient manœuvrability. This machine can be fitted with either Jaguar or Jupiter engine.

WINNERS OF THE AERIAL DERBY, 1921-1922-1923.
HOLDERS OF THE BRITISH SPEED RECORD, 212.2 M.P.H.
RECORD CLIMB OF 19,500 FEET IN 11 MINS. 34 SECS.

(Machine in each of above events fitted with Napier Lion engine)

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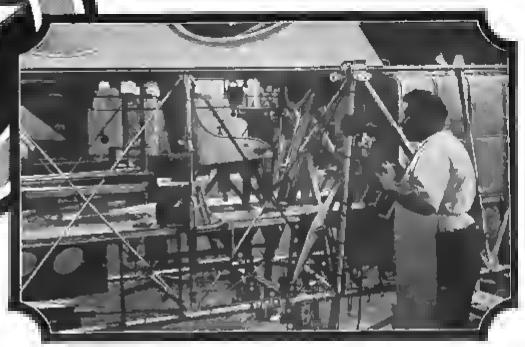

Master Craftsmen in a New Art

THE manufacture of aircraft is peculiar in this—in only a handful of localities is experienced aircraft labor available.

The Glenn L. Martin Co. is particularly fortunate on two points—first, that Cleveland furnishes a continuously ample supply of painstaking mechanics trained in precision work; second, that The Glenn L. Martin Company has collected and held together a factory organization of the most proficient of these men and has developed them into expert aircraft workers. The development of such a personnel is not an overnight process—it is the fruit of years of effort. The purchaser of a Martin plane is safeguarded by this experienced craftsmanship.

On to New York for the New York 1925 Air Races at Mitchel Field, Long Island, October 8th, 9th and 10th

Wright 200 H.P. Aircooled Engines

OFFER THE FOLLOWING ADVANTAGES

to Air Mail Bidders

Cut the first cost of planes

The first cost of mail planes including new Wright Whirlwind J4 200HP engines is about half the average of the prices recently bid to the P. O. Dept. for mail planes with Liberties. Since the P. O. Dept. makes no guarantees on quantities of air mail the bidder must assume the probable average quantities of mail. A 600 lb. mail load with a Whirlwind is approximately 24,000 letters. If any of these branch lines average as much mail as this they should pay. If they average less why pay more for a large plane to run half empty?

Reduce quantity of planes and spare engines required

Spare planes and spare engines are one of the heaviest expenses of air mail transportation. The ease with which inspections, adjustments and minor repairs are made on Whirlwind engines reduces the quantity of spare engines and spare planes required. Every "stand by" plane and engine cuts into anticipated profits. Planes with Whirlwind engines are more profitable because they are ready to be In The Air more of the time.

Insure regularity of service

The mail planes must be *ready* to leave on schedule time. The turn around time is short. It takes only an hour to change a cylinder or grind a valve in a Whirlwind. Servicing bearings and other parts is proportionately as fast. The mechanic can do almost any job required between runs and Without Taking Engine From Plane.

Cost less to operate

The low cost in time and labor for engine inspection and repairs, the excellent oil and fuel economy (sometimes less than 8 gal. per hr.), the small quantity and reasonable price of spare parts due to the unit construction all make the Whirlwind engines economical to operate.

DURABILITY

A stock Whirlwind engine flew over 100 hrs. at *full throttle* and full RPM without replacement or adjustment of a single part or loss of revs. This is the equivalent of 300 hrs. of normal part throttle flying. Many of the 16 Whirlwinds with the Huff Deland Dusters are over the 100 hr. mark carrying their 600 lbs. of dust with a hard zoom each time the cotton patch is crossed. No greater durability test could be given airplane engines than this daily grind with heavy loads, heat, rain, bad fields, dust, constant take-offs, and operating hundreds of miles from their repair bases. Durability can only be built into an engine or an automobile by constantly improving such parts as are found to give trouble. This is a task of years. A stock production Whirlwind (then Lawrence) won the Marine Trophy at the Detroit Air Meet in 1922. Since then 4 new models have been made with hundreds of changes, most of them for durability.

Decrease liability of crashes

A corollary of engine durability is safety. Dependability next to low cost is the most important characteristic of any transportation equipment. The proved dependability of the Whirlwind engines is one of the best safeguards for safe flying. In the recent Hawaiian maneuvers one squadron of 18 Whirlwinds flew over 2,000 hours with only one forced landing and that due to a stoppage in the fuel tank line.

Give high performance

The saving in weight and resistance of the water radiation systems gives either better performance, higher ceilings, or MORE PAY LOAD.

Winter and Summer Flying

The air cooled Whirlwind engines are better for extreme hot weather flying. Many instances are on record when these air cooled in extremely hot weather were flying perfectly when water cooled could not fly because of boiling. In winter draining radiators, heating water, heated hangars are all obviated by the air cooled.

WARRANTY GUARANTEE

A rigid 90 day "new car warranty" goes with each of these commercial Whirlwind engines. This warranty when backed by a responsible company is a great measure of protection to commercial operators. This warranty has been and will be administered to give real protection.

Service to Customers

We assist our customers in servicing and learning their Whirlwind engines. If they have troubles we send our service men to learn the cause and correct it. This safeguards the purchaser and helps us continue the dependability development of these Whirlwinds. We keep three service men on the road instructing and assisting. When more are needed we will get them. Spare parts are readily obtainable.

With Whirlwind engines your problems are our problems. The Wright Co. can only grow as aviation grows. We will be as earnest a worker for the success of your line as you will be, for *your success is our success.* The advantage of using new engines, made by a strong company strengthened by an unbroken chain of 22 years' experience and which is working to make the Air Mail a National Success will be appreciated by all Air Mail Bidders.

AIR MAIL BIDDERS:—*Write for Bulletin 8A which contains detailed specifications, power curves and full data for these* ***Whirlwind J4 Engines.*** *State the route for which you propose to bid, the probable number of planes you will use, etc.*

WRIGHT AERONAUTICAL CORPORATION, PATERSON, N. J.